

## Complications of Endoscopic Sinus Surgery

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Functional endoscopic sinus surgery (FESS) is a minimally invasive surgical procedure that opens up sinus air cells and sinus ostia (openings) with an endoscope. To find out the complications of Endoscopic Sinus Surgery and their management accordingly it was a cross sectional observational type of study carried out in Otolaryngology and Head-Neck Surgery Department of Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka from January 2013 to June 2013. Total 30 (Thirty) patients were included in this study. In the present study maximum 21 (70%) patients were in the age group of 21-30 years. The male patients were 22 (73.33%) and female patients were 8 (26.67%). Socioeconomic status of majority of patients were middle class family with primary educational level. In this study found 15(50%) patients were operated for chronic rhinosinusitis, 05(16.67%) patients were operated for Ethmoidal polyp, 04(13.33%) patients were operated for Antrochoanal Polyp, 02(6.67%) patients for Rhinosporidiosis, 02(6.67%) for Inverted papilloma. Both unilateral and bilateral diseases were present equally in this study. 08 (26.66%) patients developed per operative complications while 18(60%) patients developed post operative complications. Among the per-operative complications break down of lamina papyracea 04(13.33%), minor hemorrhage 03(10%) and 01(3.3%) major haemorrhage occurred. In post operative complications periorbital echymoses 5(16.67%), haemorrhage 5(16.67%) synechiae 4(13.33%), infection 2(6.67%) and epiphora 1(3.33%) were found during post operative follow up. Only 01(3.33%) patient developed CSF rhinorrhoea. To diagnose the post operative complication all the patients were evaluated clinically where in 10(55%) patients nasendoscopy was performed and CT scan done in 04(22%) patients. Endoscopic sinus surgery (ESS) has provided a safe and efficient method in the management of diseases. Post operative follow up for a long period is required for more accurate results. For preventing complications through anatomical knowledge and gentle operative technique is essential.

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**Key words:** Complications, endoscopic sinus surgery

### Introduction

Endoscopy was first introduced by D'Esoreux in 1853 when he demonstrated an alcohol illuminated urothroscope at the Paris Exhibition. After development of electricity in 1879 Lister developed a distally illuminated, water cooled cystoscope which created a lot of interest.<sup>1</sup>

Nasal and sinus endoscopy was first performed by Hirschman in 1903 using a modified Nitze cystoscope which he used in the nasal cavity and in the maxillary sinus via a tooth socket.<sup>2</sup> The introduction of nasal endoscope has revolutionized the planning and treatment of nose and paranasal sinus diseases.<sup>3</sup>

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The goal of Endoscopic Sinus Surgery treatment is complete removal of disease under direct visual control with minimal morbidity.<sup>4</sup> Surgical techniques have been significantly refined over the past 20 years with the advent of endoscopic sinus surgery.<sup>5</sup> Some studies show that radical endoscopic sinus procedures involving complete fronto-spheno-ethmoidectomy lead to greater perceived benefit.<sup>6</sup>

Endoscopic Sinus Surgery is a minimally invasive technique that uses an endoscope to improve ventilation and drainage.<sup>1,6</sup> The extent of surgery varies according to the extent of disease and surgeon's individual practice.<sup>5</sup> Advantages are claimed over conventional surgery; permitting a better view of the surgical field, a more precise and thorough clearance of inflammatory change, fewer complications and lower recurrence rate.<sup>7</sup> Surgeons performing Endoscopic Sinus Surgery must have an adequate knowledge about the anatomy, physiology, technique and complications related to this surgical procedure.<sup>5</sup> Endoscopic techniques of Messerklinger are now used during surgery.

Indications for functional endoscopic sinus surgery are recurrent acute sinusitis or chronic sinusitis that does not respond to medical therapy. Functional Approach is not applicable for all diseases of nose and paranasal sinus. In addition, Endoscopic nasal surgery have grown far beyond Functional Endoscopic Sinus Surgery and now include other nasal orbital and skull base approach such as nasal polyposis dacryocystorhinostomy, CSF leak repair, orbital decompression e.t.c.<sup>1</sup> Complication associated with endoscopic sinus surgery are divided as major complication and minor complication. Most common complications are orbital echymosis, hemorrhage and synaechia formation, The most catastrophic (major) rare complication of FESS is

blindness resulting damage to optic nerve. Another major complication is CSF leak. Most complications of endoscopic sinus surgery can be managed and preventable. So interest of endoscopic sinus surgery is gradually increasing.<sup>1</sup>

#### Aims and Objectives

*General objective:* To find out the complications of Endoscopic Sinus Surgery.

#### *Specific objective:*

1. To find out the age and sex of the patient for Endoscopic Sinus Surgery.
2. To find out the common type of complications of Endoscopic Sinus Surgery.
3. To see the recurrence rate of the sinus diseases.

#### **Methods**

It is a cross sectional observational type of study. A total of 30 (thirty) patients were included in this study from January 2013 to June 2013 in the Department of Otolaryngology and Head-Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka.

All cases attended in ENT department of Bangabandhu Sheikh Mujib Medical University with sinus diseases that operated in the period of January 2013 to June 2013 were included in this study. Patients with sinu-nasal malignancy and patients ages below 10 and over 65 years were excluded from this study.

Data was collected from prefixed predesigned data collection sheet. Data were analyzed using computer based programmed statistical package for social science (SPSS) for windows version 12.

**Operational definition**

**A. Socioeconomic groups:**

Depending on monthly income of individual or a family consisting of 4 members inclusive, as a unit (Bangladesh Bureau of statistics, 2005, modified)

Socioeconomic group	Monthly income, Taka per unit individual or a family
Poor class	Up to Tk. 5,000
Middle class	Tk 5,000 -Tk 10,000
Higher/Upper class	Above Tk-1 0,000

**B. Education status:**

As per definition of the Bangladesh Bureau of statistics, 2005, the patients were divided into following groups.

Education status:	Level of Education
Illiterate	No literacy or education at all
Primary school	Up to class V
Secondary school	Class VI to Class X
Higher Secondary	Class XI to till graduate
Graduate and above	Graduate and above

**Results**

Table II: Distribution of age group of patients (inclusive) (n=30)

Age group (years)	Number of patients	Percentage (%)
10-20	4	13.33
21-30	21	70.00
31-40	3	10.00
51-65	2	6.67

Most of the patients were between 21-40 years 21 (70%).

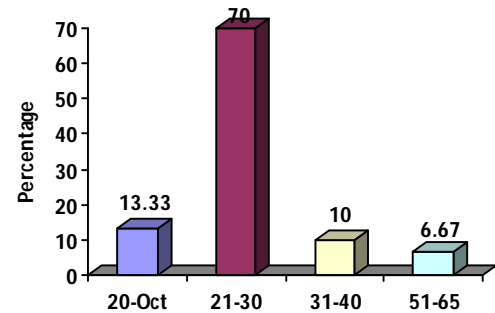


Figure 1. Distribution of age group of patients (n=30)

Table II: Distribution of sex among the patients (n=30)

Sex	Number of patients	Percentage	Male Female ratio	P value
Male	22	73.33	2.75:1	0.001
Female	8	26.67		

P value reached from chi-square test.

Table shows sex distribution of the patients 73.33% male and 26.67% female. The difference was statistically significant (P<0.05).

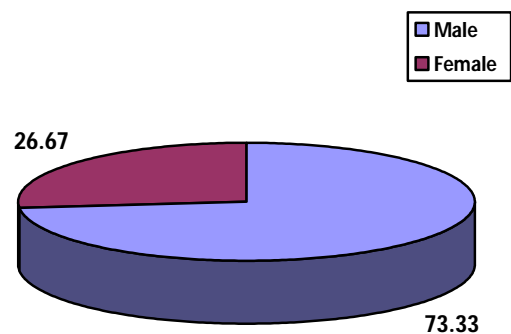


Figure 2. Distribution of sex among the patients (n=30)

Table III: Socioeconomic status of the (n=30)

Socioeconomic status	Number of patients	Percentage
Poor class	11	36.67%
Middle Class	15	50.00%
Higher Class	4	13.33%

Most of the cases were from middle class (50%).

Table IV: Educational status of the patients (n=30)

Educations status	Number of patients	Percentage
Primary School	12	40.00%
Secondary School	7	30.33%
Illiterate	5	16.66%
Higher Secondary	4	13.33%
Graduate and above	2	6.66%

Educational status most of them were primary school level

Table V: Distribution of diseases in my study (n=30)

Name of disease	Number of patients	Unilateral	Bilateral	Percentage	
				Unilateral	Bilateral
Chronic rhinosinusitis	15	05	10	33.33	66.66
Ethmoidal polyp	05	00	05	00	100
Antrochoanal polyp	04	04	00	100	00
Rhinosporidiosis	02	02	00	100	00
Inverted papilloma	02	02	00	100	00
CSF Leakage Closure	02	02	00	100	00

Bilateral diseases are chronic rhinosinusitis in 10(66.66%) patients and ethmoidal polyp in 05(100%) patients. While unilateral diseases are antrochoanal polyp in 4 (100%) patients.

Table VI: Indications of FESS in my (n=30)

Name of Disease	Number of patients	Percentage
Chronic rhinosinusitis	15	50.00
Ethmoidal polyp	5	16.67
Antrochoanal polyp	4	13.33
Rhinosporidiosis	2	6.67
Inverted papilloma	2	6.67
CSF Leakage Closure	2	6.67

Common indications were chronic rhinosinusitis 15 (50%) followed by ethmoidal polyp 5 (16.67%), antrochonal polyp 4 (13.33%).

Table VII: Procedure performed (Messerkliger's technique (n=30))

Procedure	Total patients	Bilateral (n)	Unilateral (n)	Percentage	
				Bilateral	Unilateral
Infundibulotomy	30	15	15	50	50
Middle Meatal Antrostomy	30	15	15	50	50
Anterior Ethmoidectomy	30	15	15	50	50
Posterior Ethmoidectomy	20	15	5	75	25
Sphenoidotomy	10	7	3	70	30
Frontal recess surgery	12	8	4	66.66	33.33

All patients were undergone infundibulotomy, middle meatal antrostomy, anterior ethmoidectomy.

Table VIII: Per operative complications of FESS (n=30)

Complications		Number of patients	Percentage
Minor	Break down of lamina papyracea	04	13.33
	Minor Hemorrhage	03	10
Major	Major Haemorrhage	01	3.33

Among all patients 04(13.33%) patients developed break down of lamina papyracea, 03(10%) patients developed minor hemorrhage and 01(3.33%) patients developed major hemorrhage per operatively.

Table IX: Post-operative complication of FESS (n=30)

Complications		Number of patients	Percentage	P value
Minor	Epiphora	1	3.33	0.001
	Synenechia	4	13.33	
	Periorbital echymoses	5	16.67	
	Infection	2	6.67	
	Minor Haemorrhage	4	13.33	
Major	Major Haemorrhage	1	3.33	
	CSF leakage	1	3.33	
No complication		12	40	

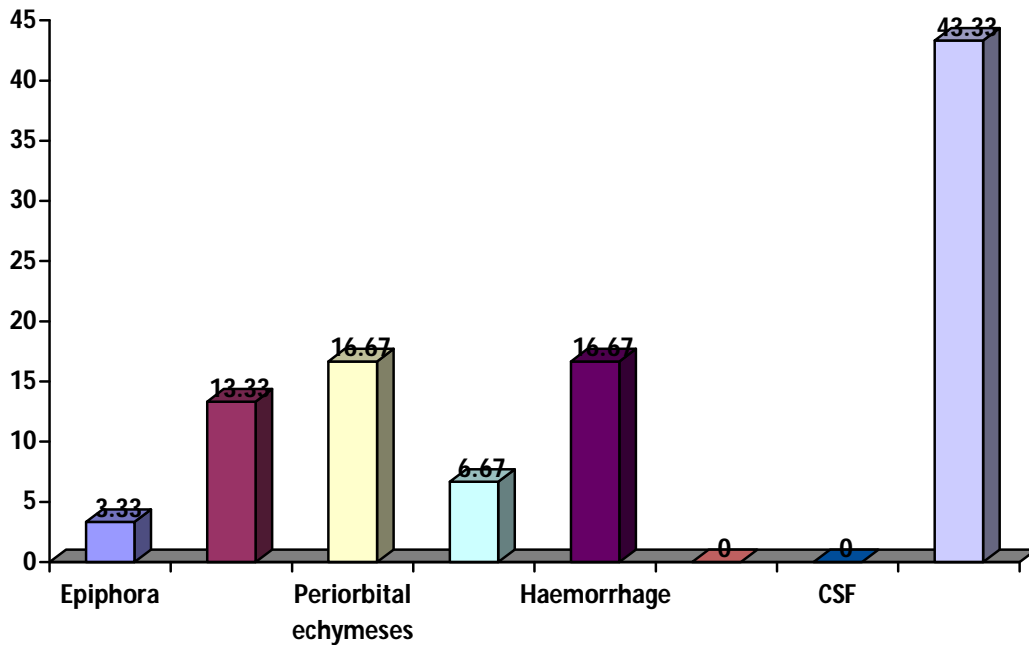


Figure 3. Post-operative complication of FESS

Table X: Diagnosis of complication of FESS (n=18)

Diagnostic tools	No. of patients	Percentage
Clinical evaluation	18	100
Nasendoscopy	10	55
CT scan of Nose and PNS with base of skull	04	22

Maximum 05(16.67%) patients developed periorbital echymosis, 01(3.33%) patient developed CSF leakage and 01(3.33%) patient developed major haemorrhage post operatively. The difference was statistically significant ( $P < 0.05$ ).

All the complicated patients were evaluated clinically, while nasendoscopy done in 10(55%) patients and CT scan done in 04(22%) patients.

### Discussion

Functional endoscopic sinus surgery (FESS) has recently become a popular technique

among the Otolaryngologists of Bangladesh. Functional Endoscopic sinus surgery is considered the treatment of choice for inflammatory sinus diseases that fails medical therapy. It is technically a challenging procedure to perform because of a limited field of vision and proximity to vital structures. Though endoscopic sinus surgery is safer than other conventional method, it has some complications as well.

In the present study maximum patients were in the age group of 21-30 years (Table I) being consistent with other standard studies.<sup>1,7,8</sup> The male patients are predominant in this study (Table-II). The male to female ratio in this study is 2.7:1 which is similar with other study groups.<sup>7,9</sup> Socioeconomic status of majority of patients were middle class family (Table III) with primary educational level (Table IV). These issues were not reported in available studies. The findings may be the reflection that most of the

people in our country are in middle class family are not highly educated.

Several diseases were treated endoscopically in this study among which Rhinosinusitis and nasal polyposis (Table VI) were the most common, both unilateral and bilateral diseases were found equally (Table V) which is consistent with other standard studies.<sup>7,8,9</sup>

The fundamental steps of Functional Endoscopic Sinus Surgery were performed according to the Messerklinger's technique (Table-VII) which includes Infundibulotomy, Middle Meatal Antrostomy, Anterior Ethmoidectomy, Posterior Ethmoidectomy. This procedure is similar with other studies.<sup>10</sup> In this study both unilateral and bilateral procedures were done.

In this series of Functional Endoscopic Sinus Surgery both pre operative (Table-VIII) and post operative complications (Table IX) occurred, among which minor complications were more and a small amount of major complications occurred which were not life threatening. These are the consistent with multiple standard studies.<sup>1,7,12,13</sup> To diagnose the post operative complications the patients were evaluated clinically and Nasendoscopy were performed and CT scan (Table-X) was done which were dictated in some standard textbooks.<sup>2</sup>

### Conclusion

Instead of some limitations, outcome of functional endoscopic sinus surgery is rapidly flourishing, highly effective, less time consuming, less hospital stay & less expensive. Successful outcome of operation can be obtained by careful evaluation and patient selection by history, examination and proper imaging of the sinuses. A cautious gradual approach to intranasal endoscopic surgery is emphasized. Post operative follow up is as important as surgery and should be

tailored to each patient's needs. The life threatening major complications are very rare but some minor complications frequently occur. For preventing post operative complications thorough anatomical knowledge and gentle operative technique is essential. Proper training in the anatomy by cadaveric dissection is mandatory to acquire proficiency in functional endoscopic sinus surgery. This study was carried over in short period of time and in small number of patients. So, further study with a larger number of samples and longer period is recommended to get a more accurate result.

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